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OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER

ZERVIGON, RUDY

ART UNIT	PAPER NUMBER
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1763

SHORTENED STATUTORY PERIOD OF RESPONSE	NOTIFICATION DATE	DELIVERY MODE
3 MONTHS	04/10/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 04/10/2007.

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patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

Office Action Summary	Application No. 10/505,169	Applicant(s) TAKAGI ET AL.	
	Examiner Rudy Zervigon	Art Unit 1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 January 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) 28-33 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>8/30/2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group I, claims 1-27 in the reply filed on January 18, 2007 is acknowledged. The traversal is on the grounds that

“

The claims of the present invention would appear to be part of an overlapping search.

”. This is not found persuasive because, as the Examiner's initial restriction illustrates, the purported overlapping search is not overlapping.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 18 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claim 18 recites the limitation “the insulation ring”. There is insufficient antecedent basis for this limitation in the claim. It is assumed Applicant meant “isolation ring”.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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6. Claims 21-23, 25, and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Watanabe et al (JP 06204143 A). Watanabe teaches a semiconductor (1; All Figures, [0010]-[0011], Machine Translation) processing device (All Figures, [0010]-[0011], Machine Translation) for processing a semiconductor (1; All Figures, [0010]-[0011], Machine Translation) while providing a processing gas into a processing space (7; All Figures, [0010]-[0011], Machine Translation) accommodating a heated (3-1, 3-2; All Figures, [0010], Machine Translation; Abstract) substrate (1; All Figures, [0010]-[0011], Machine Translation) to be processed, comprising: a processing chamber (7; All Figures, [0010]-[0011], Machine Translation) forming the processing space (7; All Figures, [0010]-[0011], Machine Translation) and capable of being pumped in vacuum; a susceptor (4; All Figures, [0010]-[0011], Machine Translation) for mounting the substrate (1; All Figures) in the processing chamber (7; All Figures, [0010]-[0011], Machine Translation); a heater (3-1, 3-2; All Figures, [0010]-[0011], Machine Translation) for heating the substrate (1; All Figures) on the susceptor (4; All Figures, [0010]-[0011], Machine Translation); a shower head (6; Figure 1; Abstract), installed at a ceiling of the processing chamber (7; All Figures, [0010]-[0011], Machine Translation), for providing the processing gas; a heat ray draining passage (14; All Figures; [0010]; Machine Translation) vertically formed through the shower head (6; Figure 1; Abstract); a radiation thermometer (5; All Figures, [0010]-[0011], Machine Translation; "pyrometer"; abstract) facing through a measurement window (8; All Figures; [0010]; Machine Translation) at an upper opening part of the heat ray draining passage (14; All Figures; [0010]; Machine Translation); and an inert gas introducing passage (14; All Figures; [0010]; Machine Translation) for introducing an inert gas into the heat ray draining passage (14; All Figures; [0010]; Machine Translation), as claimed by

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claim 21. Applicant's claim requirement of "an inert gas" is a claim requirement of intended use in the pending apparatus claims. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963); MPEP 2111.02).

Watanabe further teaches:

- i. the device (All Figures, [0010]-[0011], Machine Translation) of claim 21, wherein the inert gas is discharged from a lower end opening of the heat ray introducing passage (14; All Figures; [0010]; Machine Translation) to be diffused while the gas is falling toward outside of the susceptor (4; All Figures, [0010]-[0011], Machine Translation); and the heat ray introducing passage (14; All Figures; [0010]; Machine Translation) is spaced apart from a center of the shower head (6; Figure 1; Abstract) such that a position of a main gas stream of the inert gas discharged therefrom falls outside an outer circumference of the substrate (1; All Figures) on the susceptor (4; All Figures, [0010]-[0011], Machine Translation) when the gas stream reaches an identical horizontal level to that of an upper surface of the susceptor (4; All Figures, [0010]-[0011], Machine Translation), as claimed by claim 22. When the structure recited in the reference is substantially identical to that of the claims, claimed properties or functions are presumed

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to be inherent (In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977); MPEP 2112.01).

- ii. The device (All Figures, [0010]-[0011], Machine Translation) of claim 21, wherein a distance between a center of the shower head (6; Figure 1; Abstract) and a center of the upper opening part of the heat ray introducing passage (14; All Figures; [0010]; Machine Translation) is set to range from 70 to 100 of a radius of the substrate (1; All Figures), as claimed by claim 23. Applicant's claim requirement of "is set to range from 70 to 100 of a radius of the substrate" is a claim requirement of intended use in the pending apparatus claims depending on a non-apparatus part of the invention. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963); MPEP2111.02).
- iii. The device (All Figures, [0010]-[0011], Machine Translation) of claim 21, further comprising a support member (2,12; [0010]; Machine Translation) having a ring shape, wherein the support member (2,12; [0010]; Machine Translation) has a low thermal conductivity ("cooled jacket"; [0011]; Machine Translation), blocks heat rays emitted from the heater (3-1, 3-2; All Figures, [0010]-[0011], Machine Translation) and supports

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the susceptor (4; All Figures, [0010]-[0011], Machine Translation) by contacting a peripheral part thereof, as claimed by claim 25

- iv. The device (All Figures, [0010]-[0011], Machine Translation) of claim 21, wherein the processing gas is introduced to the inert gas introducing passage (14; All Figures; [0010]; Machine Translation), as claimed by claim 27

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-5, and 8-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al (JP 06204143 A) in view of Moslehi; Mehrdad M. (US 5846883 A). Watanabe teaches a shower head (6; Figure 1; Abstract) structure for use in a device (All Figures, [0010]-[0011], Machine Translation) for processing a semiconductor (1; All Figures, [0010]-[0011], Machine Translation) while a processing gas being provided into a processing space (7; All Figures, [0010]-[0011], Machine Translation) accommodating a heated (3-1, 3-2; All Figures, [0010], Machine Translation; Abstract) substrate (1; All Figures, [0010]-[0011], Machine Translation) to be processed, comprising: a shower head (6; Figure 1; Abstract) including a plurality of gas injection holes (14; All Figures, [0010]-[0011], Machine Translation) for providing the processing gas – claim 1

Watanabe further teaches:

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- i. The structure of claim 1, wherein a gas is discharged from a lower end opening of said one of the gas injection holes (14; All Figures, [0010]-[0011], Machine Translation) to be diffused while the gas is falling toward outside of a susceptor (4; All Figures, [0010]-[0011], Machine Translation) in the processing space (7; All Figures, [0010]-[0011], Machine Translation); and said at least one of the gas injection holes (14; All Figures, [0010]-[0011], Machine Translation) is spaced apart from a center of the shower head (6; Figure 1; Abstract) such that a position of a main gas stream of the gas discharged from said at least one of the gas injection holes (14; All Figures, [0010]-[0011], Machine Translation) falls outside an outer circumference of the substrate (1; All Figures) on the susceptor (4; All Figures, [0010]-[0011], Machine Translation) when the gas stream reaches an identical horizontal level to that of an upper surface of the susceptor (4; All Figures, [0010]-[0011], Machine Translation), as claimed by claim 4. When the structure recited in the reference is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent (In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977); MPEP 2112.01).
- ii. The structure of claim 1, wherein an inert gas is introduced to said at least one of gas injection holes (14; All Figures, [0010]-[0011], Machine Translation) through which the light introducing rod of the radiation thermometer (5; All Figures, [0010]-[0011], Machine Translation; “pyrometer”; abstract) is inserted, as claimed by claim 9. Applicant’s claim requirement of “an inert gas is introduced” is a claim requirement of intended use in the pending apparatus claims. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally

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will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963); MPEP 2111.02).

- iii. a semiconductor (1; All Figures, [0010]-[0011], Machine Translation) processing device (All Figures, [0010]-[0011], Machine Translation) for processing a semiconductor (1; All Figures, [0010]-[0011], Machine Translation) while a processing gas being provided into a processing space (7; All Figures, [0010]-[0011], Machine Translation) accommodating a heated (3-1, 3-2; All Figures, [0010], Machine Translation; Abstract) substrate (1; All Figures, [0010]-[0011], Machine Translation) to be processed, comprising: a processing chamber (7; All Figures, [0010]-[0011], Machine Translation) forming the processing space (7; All Figures, [0010]-[0011], Machine Translation) and capable of being pumped in vacuum; a susceptor (4; All Figures, [0010]-[0011], Machine Translation) for mounting the substrate (1; All Figures) in the processing chamber (7; All Figures, [0010]-[0011], Machine Translation); a heater (3-1, 3-2; All Figures, [0010]-[0011], Machine Translation) for heating the substrate (1; All Figures) on the susceptor (4; All Figures, [0010]-[0011], Machine Translation); a shower head (6; Figure 1; Abstract) provided with a plurality of gas injection holes (14; All Figures, [0010]-[0011], Machine Translation) for supplying the processing gas; and a temperature controller (not shown; [0014]; Machine Translation) for controlling the heater (3-1, 3-2; All Figures, [0010]-

- [0011], Machine Translation) based on a detected value of the radiation thermometer (5; All Figures, [0010]-[0011], Machine Translation; “pyrometer”; abstract) – claim 10
- iv. The device (All Figures, [0010]-[0011], Machine Translation) of claim 10, further comprising a support member (2,12; [0010]; Machine Translation) having a ring shape, wherein the support member (2,12; [0010]; Machine Translation) has a low thermal conductivity (“cooled jacket”; [0011]; Machine Translation), blocks heat rays emitted from the heater (3-1, 3-2; All Figures, [0010]-[0011], Machine Translation) and supports the susceptor (4; All Figures, [0010]-[0011], Machine Translation) by contacting a peripheral part thereof, as claimed by claim 11
- v. The device (All Figures, [0010]-[0011], Machine Translation) of claim 10, wherein a gas is discharged from a lower end opening of said one of the gas injection holes (14; All Figures, [0010]-[0011], Machine Translation) to be diffused while the gas is falling toward outside of the susceptor (4; All Figures, [0010]-[0011], Machine Translation) in the processing space (7; All Figures, [0010]-[0011], Machine Translation); and said at least one of the gas injection holes (14; All Figures, [0010]-[0011], Machine Translation) is spaced apart from a center of the shower head (6; Figure 1; Abstract) such that a position of a main gas stream of the gas discharged from said at least one of the gas injection holes (14; All Figures, [0010]-[0011], Machine Translation) falls outside an outer circumference of the substrate (1; All Figures) on the susceptor (4; All Figures, [0010]-[0011], Machine Translation) when the gas stream reaches an identical horizontal level to that of an upper surface of the susceptor (4; All Figures, [0010]-[0011], Machine Translation), as claimed by claim 13. When the structure recited in the reference is

substantially identical to that of the claims, claimed properties or functions are presumed to be inherent (In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977); MPEP 2112.01).

- vi. The device (All Figures, [0010]-[0011], Machine Translation) of claim 10, further comprising a temperature measuring device (15; All Figures, [0010], Machine Translation) installed at the susceptor (4; All Figures, [0010]-[0011], Machine Translation); and a temperature compensator (“thermoregulator”; not shown, [0010], Machine Translation) for correcting a setting temperature value of the susceptor (4; All Figures, [0010]-[0011], Machine Translation) for the temperature controller (not shown; [0014]; Machine Translation) based on a detection value of the radiation thermometer (5; All Figures, [0010]-[0011], Machine Translation; “pyrometer”; abstract) and a target temperature (“predetermined value”; [0010], Machine Translation) value of the substrate (1; All Figures), when the detection value and the target temperature (“predetermined value”; [0010], Machine Translation) value are obtained by performing dummy process by way of using a dummy substrate (1; All Figures) for correcting temperature, as claimed by claim 15. Applicant’s claim requirement of “by performing dummy process by way of using a dummy substrate for correcting temperature” is a claim requirement of intended use in the pending apparatus claims. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably

distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto, 136 USPQ 458, 459 (CCPA 1963); MPEP 2111.02).

- vii. The device (All Figures, [0010]-[0011], Machine Translation) of claim 15, wherein the temperature measuring device (15; All Figures, [0010], Machine Translation) is a thermocouple (“thermocouple”; [0010], Machine Translation), as claimed by claim 16

Watanabe does not teach at least one light introducing rod of a radiation thermometer (5; All Figures, [0010]-[0011], Machine Translation; “pyrometer”; abstract) inserted through at least one of the gas injection holes (14; All Figures, [0010]-[0011], Machine Translation) – claim 1

Watanabe further does not teach:

- i. The structure of claim 1, wherein the shower head (6; Figure 1; Abstract) includes a gas injection surface (lowest surface of 6; All Figures, [0010]-[0011], Machine Translation) where the gas injection holes (14; All Figures, [0010]-[0011], Machine Translation) are provided and the light introducing rod is inserted through a gas injection hole (14; All Figures, [0010]; Machine Translation) located at a substantially central part of the gas injection surface (lowest surface of 6; All Figures, [0010]-[0011], Machine Translation), as claimed by claim 2
- ii. The structure of claim 1, wherein the shower head (6; Figure 1; Abstract) includes a gas injection surface (lowest surface of 6; All Figures, [0010]-[0011], Machine Translation) where the gas injection holes (14; All Figures, [0010]-[0011], Machine Translation) are provided and said at least one light introducing rod is inserted through a number of gas injection holes (14; All Figures, [0010]-[0011], Machine Translation), respectively,

- which are arranged along a radial direction of the gas injection surface (lowest surface of 6; All Figures, [0010]-[0011], Machine Translation) and at least one of which is located at a substantially central part of the gas injection surface (lowest surface of 6; All Figures, [0010]-[0011], Machine Translation), as claimed by claim 3
- iii. The structure of claim 1, wherein an opening area of a gas injection hole (14; All Figures; [0010]; Machine Translation) through which the light introducing rod is inserted is larger than an opening area of another gas injection hole (14; All Figures; [0010]; Machine Translation) by a cross sectional area of the light introducing rod, an identical gas being injected through the gas injection hole (14; All Figures; [0010]; Machine Translation) and said another gas injection hole (14; All Figures; [0010]; Machine Translation), as claimed by claim 5
- iv. The structure of claim 1, wherein, in addition to the gas injection holes (14; All Figures, [0010]-[0011], Machine Translation) for providing an assist gas as the processing gas, the shower head (6; Figure 1; Abstract) further includes plural gas injection holes (14; All Figures, [0010]-[0011], Machine Translation) for providing a source gas and the shower head (6; Figure 1; Abstract) is configured such that the assist gas and the source gas are prevented from being mixed with each other therein, as claimed by claim 8
- v. at least one light introducing rod of a radiation thermometer (5; All Figures, [0010]-[0011], Machine Translation; “pyrometer”; abstract) inserted through at least one of the gas injection holes (14; All Figures, [0010]-[0011], Machine Translation) – claim 10
- vi. The device (All Figures, [0010]-[0011], Machine Translation) of claim 10, wherein an inert gas is introduced to said at least one of gas injection holes (14; All Figures, [0010]-

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[0011], Machine Translation) through which the light introducing rod of the radiation thermometer (5; All Figures, [0010]-[0011], Machine Translation; “pyrometer”; abstract) is inserted, as claimed by claim 14. Applicant’s claim requirement of “wherein an inert gas is introduced” is a claim requirement of intended use in the pending apparatus claims. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963); MPEP2111.02).

- vii. The device (All Figures, [0010]-[0011], Machine Translation) of claim 10, further comprising an isolation ring, installed on an upper side of a peripheral part of the susceptor (4; All Figures, [0010]-[0011], Machine Translation) for blocking heat rays, as claimed by claim 12

Moslehi teaches a wafer processing apparatus (Figure 22) including one light transmitting rod (604; Figure 22) inserted through Moslehi’s gas injection shoehead (602; Figure 22). Moslehi further teaches independent, unmixed, gas injection conduits (112, 114, 116; Figure 1) for injecting gases into three independent zones (118, 120, 122; Figure 1; column 7; lines 13-33).

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It would have been obvious to one of ordinary skill in the art at the time the invention was made to add Moslehi's light transmitting rod (604; Figure 22) and independent gas paths to Watanabe's apparatus.

Motivation to add Moslehi's light transmitting rod (604; Figure 22) and independent gas paths to Watanabe's apparatus is for process monitoring and control as taught by Moslehi (column 23; lines 39-49), and for processing spatial control (column 18; lines 61-67).

9. Claims 17, 18, 19, 20, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al (JP 06204143 A) in view of Tanaka, Sumi et al. (US 20040020599 A1). Watanabe teaches a semiconductor (1; All Figures, [0010]-[0011], Machine Translation) processing device (All Figures, [0010]-[0011], Machine Translation) for processing a semiconductor (1; All Figures, [0010]-[0011], Machine Translation) while providing a processing gas into a processing space (7; All Figures, [0010]-[0011], Machine Translation) accommodating a heated (3-1, 3-2; All Figures, [0010], Machine Translation; Abstract) substrate (1; All Figures, [0010]-[0011], Machine Translation) to be processed, comprising: a processing chamber (7; All Figures, [0010]-[0011], Machine Translation) forming the processing space (7; All Figures, [0010]-[0011], Machine Translation) and capable of being pumped in vacuum; a susceptor (4; All Figures, [0010]-[0011], Machine Translation) for mounting the substrate (1; All Figures) in the processing chamber (7; All Figures, [0010]-[0011], Machine Translation); a heater (3-1, 3-2; All Figures, [0010]-[0011], Machine Translation) including a heating lamp ("lamp"; [0002], Machine Translation), installed below the susceptor (4; All Figures, [0010]-[0011], Machine Translation), for heating the substrate (1; All Figures) on the susceptor (4; All Figures, [0010]-[0011], Machine Translation); a support member (2,12; [0010]; Machine

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Translation) having a ring shape for supporting the susceptor (4; All Figures, [0010]-[0011], Machine Translation) by contacting a peripheral part thereof; a shower head (6; Figure 1; Abstract), installed at a ceiling of the processing chamber (7; All Figures, [0010]-[0011], Machine Translation), for supplying the processing gas; and a temperature controller (not shown; [0014]; Machine Translation) for controlling the heater (3-1, 3-2; All Figures, [0010]-[0011], Machine Translation) based on a detected value of the radiation thermometer (5; All Figures, [0010]-[0011], Machine Translation; “pyrometer”; abstract) – claim 17

Watanabe further teaches:

- i. The device (All Figures, [0010]-[0011], Machine Translation) of claim 17, wherein the radiation thermometer (5; All Figures, [0010]-[0011], Machine Translation; “pyrometer”; abstract) is installed at the shower head (6; Figure 1; Abstract) and faces toward a hole (14; All Figures; [0010]; Machine Translation) for discharging a gas, and wherein the gas is discharged from a lower end opening of the hole (14; All Figures; [0010]; Machine Translation) to be diffused while the gas is falling toward outside of the susceptor (4; All Figures, [0010]-[0011], Machine Translation); and the hole (14; All Figures; [0010]; Machine Translation) is spaced apart from a center of the shower head (6; Figure 1; Abstract) such that a position of a main gas stream of the gas discharged therefrom falls outside an outer circumference of the substrate (1; All Figures) on the susceptor (4; All Figures, [0010]-[0011], Machine Translation) when the gas stream reaches an identical horizontal level to that of an upper surface of the susceptor (4; All Figures, [0010]-[0011], Machine Translation), as claimed by claim 20. When the structure recited in the reference is substantially identical to that of the claims, claimed properties or functions

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are presumed to be inherent (In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977); MPEP 2112.01).

Watanabe does not teach:

- i. wherein the support member (2,12; [0010]; Machine Translation) is colored for blocking heat rays emitted from the heating lamp (“lamp”; [0002], Machine Translation) – claim 17
- ii. a radiation thermometer (5; All Figures, [0010]-[0011], Machine Translation; “pyrometer”; abstract) attached to an upper part of the shower head (6; Figure 1; Abstract) – claim 17
- iii. The device (All Figures, [0010]-[0011], Machine Translation) of claim 17, further comprising an isolation ring, installed at an upper side on the peripheral part of the susceptor (4; All Figures, [0010]-[0011], Machine Translation), for blocking heat rays, as claimed by claim 18
- iv. The device (All Figures, [0010]-[0011], Machine Translation) of claim 18, wherein the support member (2,12; [0010]; Machine Translation) and the insulation ring are substantially made of a material selected from the group consisting of black ceramics of quartz containing black metal oxide including niobium oxide, quartz containing black SiC, quartz containing carbon or black AlN containing carbon, as claimed by claim 19
- v. The device (All Figures, [0010]-[0011], Machine Translation) of claim 21, further comprising an isolation ring, installed on an upper side of a peripheral part of the susceptor (4; All Figures, [0010]-[0011], Machine Translation), for blocking heat rays, as claimed by claim 26

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Tanaka teaches a wafer processing apparatus (Figure 6) for wafer processing including an white colored aluminum nitride isolation ring (402; Figure 2; [0020]), installed at an upper side on the peripheral part of the susceptor (403; Figure 2).

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Watanabe to add Tanaka's isolation ring.

Motivation for Watanabe to add Tanaka's isolation ring is to secure Watanabe's wafer as taught by Tanaka ([0020]).

10. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al (JP 06204143 A). Watanabe is discussed above. Watanabe does not teach the device (All Figures, [0010]-[0011], Machine Translation) of claim 21, wherein a distance between a lower surface of the shower head (6; Figure 1; Abstract) and an upper surface of the susceptor (4; All Figures, [0010]-[0011], Machine Translation) is in a range from 20 mm to 30 mm, and a flow rate of the inert gas is in a range from 3 sccm to 100 sccm, as claimed by claim 24. Applicant's claim requirement of "a flow rate of the inert gas is in a range from 3 sccm to 100 sccm" is a claim requirement of intended use in the pending apparatus claims. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963); MPEP2111.02).

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It would have been obvious to one of ordinary skill in the art at the time the invention was made for Watanabe to optimize the dimension(s) and/or relative position of Watanabe's apparatus.

Motivation for Watanabe to optimize the dimension(s) and/or relative position of Watanabe's apparatus is for optimizing processing and/or accomodating wafers of varying size and shapes. It is well established that changes in apparatus dimensions are within the level of ordinary skill in the art.(Gardner v. TEC Systems, Inc. , 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied , 469 U.S. 830, 225 USPQ 232 (1984); In re Rose , 220 F.2d 459, 105 USPQ 237 (CCPA 1955); In re Rinehart, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); See MPEP 2144.04). It is well established that the rearrangement of parts is considered obvious to those of ordinary skill (In re Japikse , 181 F.2d 1019, 86 USPQ 70 (CCPA 1950); In re Kuhle , 526 F.2d 553, 188 USPQ 7 (CCPA 1975); Ex parte Chicago Rawhide Manufacturing Co. , 223 USPQ 351, 353 (Bd. Pat. App. & Inter. 1984).; MPEP 2144.04).

11. Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al (JP 06204143 A) in view of Moslehi; Mehrdad M. (US 5846883 A) and Kawada; Hiroki et al. (US 5536359 A). Watanabe and Moslehi are discussed above. Watanabe and Moslehi do not teach:

- i. The structure of claim 1, further comprising an elevator for moving the light introducing rod up and down, wherein the elevator selectively retreats the light introducing rod from said at least one of the gas injection holes (14; All Figures, [0010]-[0011], Machine Translation) through which the light introducing rod is inserted, as claimed by claim 6
- ii. The structure of claim 6, further comprising a separation mechanism for selectively closing said at least one of the gas injection holes (14; All Figures, [0010]-[0011],

Machine Translation) through which the light introducing rod is inserted, as claimed by claim 7


Kawada teaches a retractable radiation transmission rod (19; Figures 3(a,b); column 6; lines 13-24) including a separation mechanism (23; Figures 3(a,b); column 7; lines 45-56) for selectively closing the radiation transmission rod's conduit (22; Figures 3(a,b); column 7; lines 45-56).

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Watanabe and Moslehi to add Kawada's radiation transmission rod control means.

Motivation for Watanabe and Moslehi to add Kawada's radiation transmission rod control means is for protecting the apparatus from corrosive environments as taught by Kawada (column 7; lines 45-56).

Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (571) 272-1442. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official fax phone number for the 1763 art unit is (571) 273-8300. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (571) 272-1700. If the examiner can not be reached please contact the examiner's supervisor, Parviz Hassanzadeh, at (571) 272-1435.


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